А. В. Дьячкова, Л. И. Кулькова

Организационно-управленческие решения обеспечения дистанционного взаимодействия в образовательном процессе в школе

Введение. Цифровизация образования в условиях пандемии послужила важным фактором трансформации традиционных форм коммуникаций, переведя все многообразие взаимодействий участников образовательных отношений в дистанционный формат. В ситуации изменчивости и неопределенности обострилась проблема поиска эффективных организационно-управленческих решений для выполнения стоящих перед школой задач с применением современных дистанционных технологий.

Методы исследования. Для выявления организационно-управленческих решений, оценки их эффективности была применена совокупность методов: анкетирование педагогов с опорой на исследования Heldt, Lorenz and Eickelmann; статистические методы при анализе анкетных данных (среднее значение, стандартное отклонение), метод сравнения дизайна дистантного взаимодействия общеобразовательных организаций России и Германии.

Результаты исследования. Выявлены организационно-управленческие решения, обеспечившие эффективные коммуникации по решению задач гимназии в дистантном формате; установлено, что эффективность дистанционной работы обеспечена комплексом управленческих решений, направленных на обеспечение разных видов поддержки – технической, педагогической, организационной; обосновано, что разработка и принятие медиа-концепции, регламента, инструкций, рекомендаций по организации и осуществлению цифровой коммуникации, создание единых медиаканалов в системах взаимодействий «ученики – учитель», «родитель – учитель», «учитель – администрация школы», «родитель – администрация школы», участие педагогов в программах повышения квалификации в совокупности обеспечили решение комплекса задач в условиях обострения эпидемиологической ситуации и в целях здоровьесбережения; определены формы корпоративного цифрового диалога: обмен практиками эффективных коммуникаций, система поддержки и взаимопомощи, взаимообучение.

Ключевые слова: цифровизация, организационно-управленческие решения, медиа-концепция, цифровые коммуникации, дизайн дистанционного взаимодействия, онлайн-обучение, цифровой диалог

A. V. Diachkova, L. I. Kulkova

Organizational and managerial solutions for online (distance) interaction in the educational process at the school

Introduction. The digitalization of education in the context of a pandemic served as an important factor in the transformation of traditional forms of communication, transferring all the variety of interactions between participants in educational relations into a distance format. In a situation of variability and uncertainty, the problem of finding effective organizational and managerial solutions to fulfill the tasks facing the school with the use of modern distant technologies has become keener.

Research methods. To identify organizational and managerial decisions, to assess their effectiveness, a set of methods was used: questioning of teachers based on the research of Heldt, Lorenz and Eickelmann; statistical methods in the analysis of personal data (mean, standard deviation), a method for comparing the design of distant interaction between educational institutions in Russia and Germany.

Results. Organizational and managerial solutions have been identified that ensured effective communication in solving the problems of the gymnasium in a distant format; it was found that the effectiveness of remote work is provided by a set of management decisions aimed at providing different types of support – technical, pedagogical, organizational; substantiated that the development and adoption of a media concept, regulations, instructions, recommendations for the organization and implementation of digital communication, the creation of unified media channels in the interaction systems "students – teacher", "parent – teacher", "teacher – school administration", "parent – school administration", the participation of teachers in advanced training programs in aggregate ensured the solution of a complex of problems in the context of an aggravated epidemiological situation and in order to preserve health; defined the forms of corporate digital dialogue: exchange of effective communication practices, a system of support and mutual assistance, mutual training.

Keywords: digitalization, organizational and management decisions, media concept, digital communications, design of distance interaction, online training, digital dialogue

Introduction

The ongoing process of digitalization of education in a new epidemiological environment dictates a new format for interaction between all participants in the educational process: school administration, teachers, students and parents. We are talking about different forms and types of digital technologies that allow distant, but in a timely and effective manner to solve key teaching and learning tasks.

Due to the fact that the National Program "Digital Economy of the Russian Federation" was launched in Russia two years ago, advanced schools already have the necessary hardware and software.

Therefore, in conditions of physical isolation at the end of March 2020 due to the pandemic, such schools were able to organize distant interaction between all participants in the educational process. At the same time, the school management was faced with the task of flexibly and instantly making decisions to prevent or eliminate technical communication failures. The experience of these leading schools can be useful for roadmap design and activities to develop new forms of distant interaction.

The global research community is actively studying the issue of assessing the ICT environment and literacy in different countries of the world. The International Association for the Assessment of Educational Achievements IEA has been leading the International Computer and Information Literacy Study (ICILS) project since 2013. The empirical study included a large-scale survey of students, teachers and school administrators around the world in 2013 and 2018 [1]. On the basis of reports on these studies, many articles have been prepared on the assessment of educational policy [2; 3; 4; 5], the identification of effective school practices [6; 7; 8], the definition of conditions conducive to progress in education [9; 10]. The main thematic blocks of research can be conditionally divided into three groups: the study and assessment of students' ICT literacy, ICT skills of teachers, pedagogical and technical support from the school administration.

Drossel, Eickelmann & Vennemann (2020) cite the results of the IEA-ICILS, 2018 study. They identify the factors of high rates of computer and information literacy. Those schools that "are committed to supporting digital literacy of learners and innovative design of learning processes using information and communication technologies (ICT)… are considered to be organizationally sustainable" [11]. It is the active implementation of ICT in the educational process that ensures high and average indicators of ICT literacy among students, regardless of their socio-economic status.

Earlier in their study, Drossel & Eickelmann pointed to the primacy of teachers' ICT skills as a prerequisite for effective education. "Teachers play a key role with their competencies in the use of new technologies, which is an important prerequisite for the effective implementation of such skills" [12]. Consequently, organizational solutions are needed to continuously improve the qualifications of teachers.

In scientific articles, researchers have identified the relationship between the level of ICT proficiency by teachers and their integration into active use in the educational process. Fluency in ICT is an incentive, while insufficient development of ICT competencies is an obstacle to the integration of new technologies into the educational process [13; 14].

Consequently, the key task of schools and state policy is to improve the qualifications of teachers [15; 16; 17].

A study by Morris et al. (2003) recognizes effective systemic professional development, both external (didn't make by the school where the teachers work) and internally (made by the school administration) [18].

Boone (2010) and Nuttall (2013) in their articles come to a different conclusion, noting that external professional development is not systemic in nature, distracts from the main educational process. While the teachers themselves are able to share their experience with each other within their organization [19; 20].

It should be noted that, while recognizing the importance of students' computer literacy, the scientific community considers the issue of creating technical, organizational and psychological conditions in schools and improving the qualifications of teachers in this area a priority.

This activity acquires great significance and relevance in the new realities, which require all participants to be constantly involved in the educational process at the same time, and to be able to distance themselves, including following an individual educational trajectory.

Thus, the purpose of this article is to characterize effective organizational and managerial solutions to ensure distant forms of interaction between all participants in the educational process using the experience of an an leading city school as an example.

Materials and research methods

The practical research was carried out on the basis of the MAEO Gymnasium 9 (Yekaterinburg, Russia). The gymnasium is the leading school in the city, for many years it has been included in the Top schools in Russia. In 2019 it took a 50th position in the ranking.

To assess the information and software provision of the school, we used the data of two years of school experience, reports on the school's self-estimation. Evaluation of the effectiveness of decisions made on ensuring constant interaction between participants in the educational process was carried out on the basis of anonymous questionnaires of teachers and parents. The questions were formulated in a closed manner. Key questions were based on research by Heldt, Lorenz and Eickelmann [21]. 45 teachers of the school took part in the interview. Descriptive statistics of the obtained data from the survey (arithmetic mean, standard deviation) were carried out.

Research results and discussion

Literature review

In the task of remote interaction, the formation of the digital environment of the school is paramount. This includes informational and pedagogical support for teachers. Heldt, Loren and Eickelmann (2020) define technical support "as the measure required to provide the technical functionality of digital media in schools. This includes tasks such as servicing, repairing, purchasing or replacing devices, and installing software with basic instructions for use" [21, p. 456].

To implement this support, a specially organized, permanently functioning service is needed at the school, employees who will solve this problem, including remotely. The result of this service is the development of ICT-skills and digital skills for teachers. Implementing the concept of "smart personality" a teacher can fluently use information technologies. They can be "immersed in the interests of educational, professional or other creative activities in

the virtual space but also has formed universal competencies, due to which communication risks are minimized" [22, p. 121]. So that, key task of school administration is to form a "smart" teacher.

The effective interaction of all participants in the educational process can be measured through the confidence of teachers in technical support, systemic communication of all participants in the educational process: teacher – student (s), teacher – parent, school administration – students, school administration – parents.

According to Bos et al. (2019) pedagogical support means "all measures that support the needs-based and learning-enhancing integration of digital media into teaching and learning" [cited from 21, p. 457]. Here we are talking about advanced training programs, methodological seminars and master classes aimed at sharing experience on the introduction of new technologies in the learning process, finding solutions to problems that arise when using digital technology in teaching.

All these activities require the school administration to develop a support program, regulations, and attract financial and human resources.

It should be noted that an important issue in this resource problem is the interest and participation of local authorities in the organization and provision of the necessary schools [23]. Funding the school in the acquisition of new equipment, software, group subscriptions to electronic educational resources, organization of professional development programs on-the-job and in-service professional development are key conditions for effective interaction in a distant form.

Similar forms of interaction are presented in Blau and Shamir-Inbal (2017). The authors note the successful introduction of electronic collaboration and electronic communication among teachers, students and their parents [23].

It should be noted that having access to financial and human resources, having secured the support of the city administration, the school is only then ready to form an ICT environment and introduce new distant forms of interaction between all participants in the educational process. This process is of a stepwise nature. According to Pettersson (2020), the school consistently goes through three stages of digitalization (Fig. 1).
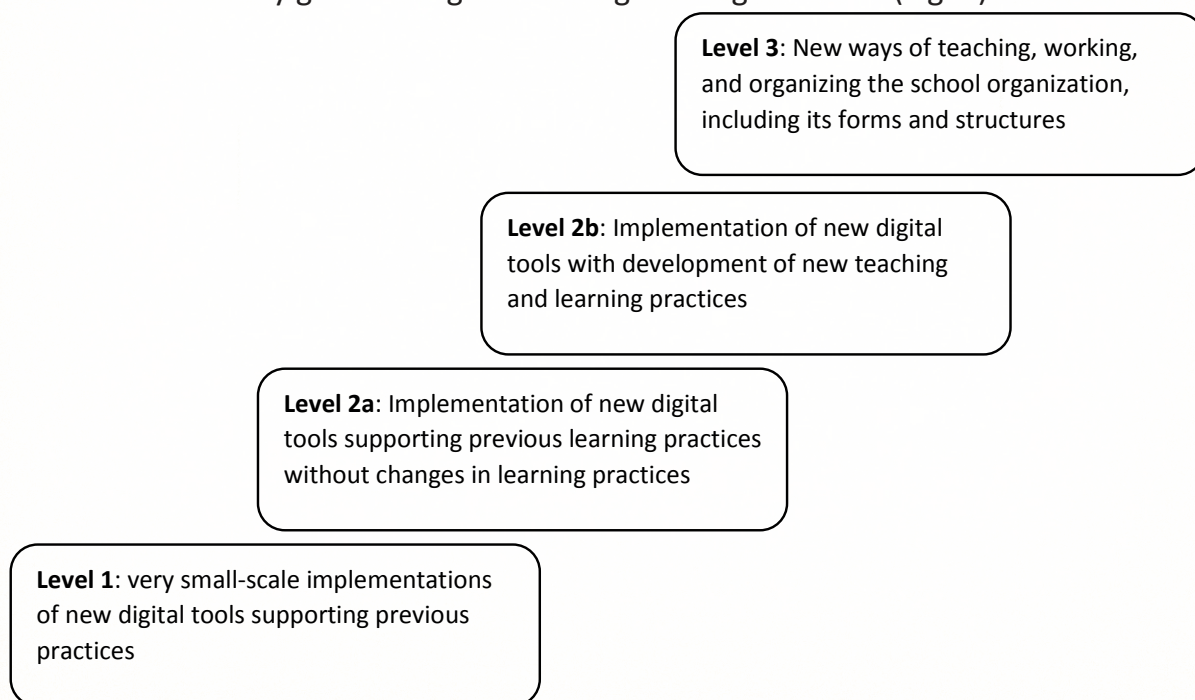
Level 3: New ways of teaching, working, and organizing the school organization, including its forms and structures

Level 2b: Implementation of new digital tools with development of new teaching and learning practices

Level 2a: Implementation of new digital tools supporting previous learning practices without changes in learning practices

Level 1: very small-scale implementations of new digital tools supporting previous practices

Figure 1 Learning levels of digitalization school [inspired by Pettersson, 24]

In our opinion, the distant format of interaction between all participants in the educational process is possible only at level 2b, when technical and pedagogical conditions have already been created for the implementation. New teaching practices are not only the use of new electronic educational resources, but also communication among teachers, school administration, parents, students.

We emphasize that technical and pedagogical support is a necessary but not a sufficient condition for providing new distant technologies. The activity of the process of school transition from one level to another is also associated with the desire of teachers to introduce new things into the educational process. Changing the routine actions of teachers to a new format requires additional efforts, primarily time to master new technologies.

Aesaert et al (2015) in their article argue that it is the attitude and readiness to accept new things on the part of teachers that are the main factor in the formation of an effective ICT environment and distant interaction [25].

The first to respond to the introduction of new distant forms will be, in the classification of Peled et al. (2011), teachers Initiators and Pioneers [26]. They are the ones who are active in the development and use of digital electronic communication channels in the educational environment, often on their own initiative. These teachers "are exposed to new technological ideas, they understand the potential of innovation for teaching, learning and school effectiveness. This awareness creates a positive attitude towards innovations and increases the motivation to use them" [26]. Here the school administration only supports the teachers' initiative. The administration is actively forced to work with followers and conformists, to overcome their passivity or unwillingness to master new technologies.

As a result, it is necessary to take into account that, as a rule, all types of teachers are present in the teaching staff, their speed of mastering and using distant technologies will be different. Therefore, they need a different level of technological and pedagogical support.

Developing this idea, we can talk about the importance of corporate culture at school in the process of introducing distant communication methods. Here, teachers provide each other with informal support in mastering new technologies and give master classes, share their successful experience. A strong corporate culture also contributes to the rapid adaptation of new teachers, their adoption of new technologies and communication forms. Hauge and Norenes (2014) believe that new teachers perceive advanced forms as ordinary rules and quickly fit into the modern educational process [27].

Results of the survey

Let's turn to the experience of the leading gymnasium in the city of Yekaterinburg. This status is confirmed by the nationwide rating of schools. For several years the school has been among the best schools in Russia (RAEX rating agency) [28]. According to self-estimation reports, the material and technical base is equipped with fully modern equipment and computer programs. All classrooms have Internet access. On a regular basis during the vacation period, there are short-term professional development programs, including the introduction of distant forms of education [29].

This indicates sufficient technical and pedagogical support from the school administration.

The main form of digital communication between teacher and parents, teacher and students outside the classroom is an electronic diary. Since 2018, the school has completely switched to an electronic diary on the Dnevnik.ru platform.

However, an interesting question is whether teachers perceive these conditions as

sufficient and whether they use these opportunities for distant interaction with participants in an educational institution? To understand this, a survey of teachers was carried out. The survey questions were based on the Heldt, Lorenz and Eickelmann survey program [21]. The answers to the questionnaire could be: "yes" 1, "no" 0. Questions of a qualitative nature allowed the answers "completely satisfied" 3, "sufficiently" 2, "not enough" 1, "no" 0. The results of the questionnaire are presented in Table.

Table

Results of questioning teachers on distant forms of interaction
[*inspired by Heldt, Lorenz and Eickelmann, 21]

Question	MW	SD	Min	Max
School structure				
Does your school have a media concept*, **?	0,61	0,39	0	1
Sufficient IT equipment available*	0,48	0,58	0	1
Frequency of ITC use (every day)*	0,7	0,36	0	1
To what extent are current school activities reflected and visible through the school portal (gymnasium website, electronic diary)?	2,01	0,57	0	3
Technical support				
Overall, how satisfied are you with the technical support at your school?*	1,87	0,92	0	3
School's policies and technical assistance support the use of digital media in communication with students	0,92	0,23	0	1
School's policies and technical assistance support the use of digital media in communication with parents	0,89	0,29	0	1
Sufficient technical support for the school to use its own teacher equipment*	0,51	0,43	0	1
Educational support				
Overall, how satisfied are you with the educational support at your school?*	1,32	0,82	0	3
School's policies and educational assistance support the use of digital media in communication with students	0,90	0,11	0	1
School's policies and educational assistance support the use of digital media in communication with parents	0,84	0,13	0	1
Management actions taken for two years				
advanced training programs were carried out on the use of distant forms of interaction	0,64	0,31	0	1
Instructions and recommendations were developed on the organization, rules of conduct and computer platforms for distant forms of interaction	0,78	0,23	0	1

** media concept is an adopted uniform program and policy of interaction between participants in the educational process in a distant format.

These tables indicate, in general, the correspondence of technical, organizational and pedagogical conditions in the school and teachers' perception of this for the implementation of distant interaction.

Standart deviation of opinions on the media concept does not exceed 0.39. Teachers are familiar with its design. They also objectively acknowledge the school's work in introducing new forms of interaction.

The school administration, according to teachers, should act as the initiator and organizer of distant interaction, and the teacher – the performer.

Different answers were received to questions assessing the satisfaction of technical and pedagogical support. Here the range of opinions is already very large (SD 0.92). This

is largely due to some inertia of teachers in the development of new technologies, high teaching load. This was confirmed in the received answers to the question, what are the reasons for the insufficient use of distant forms of interaction (Fig. 2).

Figure 2 Main reasons for insufficient use of digital communication, teachers' responses

With the introduction of quarantine measures in the country and in the region, schools switched to distant interaction. However, at school it was not spontaneous.

Methodological seminars, master classes and trainings dedicated to teaching work on new platforms were held. It should be noted that the main thing that was done was a developed unified concept for distant communication with students, parents and school administration. Teachers note that it was as a key condition that allows them to successfully conduct the educational process, to solve the main educational problems in new conditions. Here they are united in their opinions (SD = 0.23).

The concept of distant interaction is focused on ensuring constant communication between students, their parents and teachers. In the normal mode of operation, for several years now, the main forms of digital communication have been the gymnasium website, with relevant and necessary information and an electronic diary. Teachers mark e-diary as an effective form of digital communication. Timely filling in the current progress of students, homework, announcements remove some ambiguities from parents who are involved in the learning process in this way.

Of course, in the new realities, all teachers were forced to interact in a distant format. In conditions of uncertainty, new formats of teaching, teachers acted as a guarantor of confident, calm and effective learning. Additional communication channels were created: teacher and parent groups, teacher – students in Watsapp. The reason for creating additional channels is the excessive load on Dnevnik.ru and the support of communications in case of failures with the main channel. The teachers in the questionnaires chose which communication channels were the most common for the quarantine and at the present time (Fig. 3).

Since the electronic diary is the main document in the school, therefore, other forms may be informal and are intended to provide information in a timely manner during information failures. Therefore, their share is not high. Although the teachers noted in the questionnaire that they duplicated the information of the electronic diary in chats.
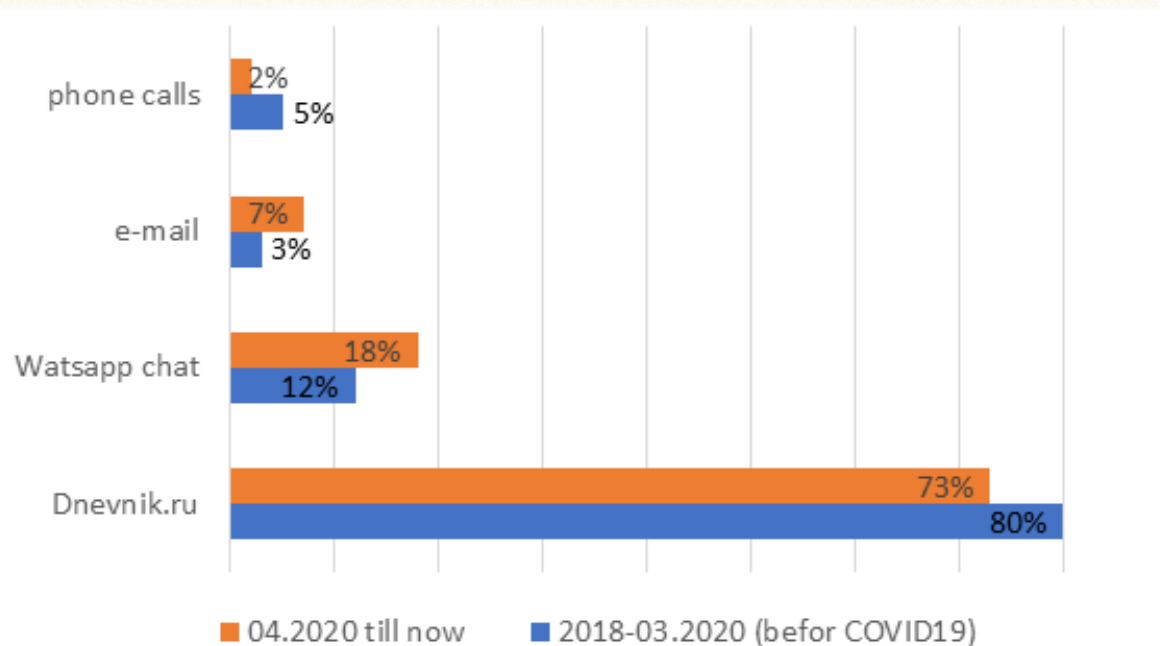
Figure 3 Basic forms of digital communication at school before quarantine and now

The next regulation in the concept of distant communication is communication between students and teachers on one unified platform so that students and parents have uniformity, there is no confusion, complexity and technical limitations. It should be noted that a permanent communication channel was also established – a chat between the school administration and teachers for the timely resolution of emerging issues.

In general, students, parents, teachers and school administrators note the efficiency of distant forms of communication. This provides advantages in the availability and timeliness of the transmission and reception of information, as well as mobility.

With the resumption of the traditional format of teaching at school, forms of digital communication have been preserved and developed. Thus, it is planned to continue work on the development of the concept of digital distant interaction, to use online platforms for methodological meetings, parent meetings, master classes, and round tables. Online communication has shown the possibility of dialogue and the effectiveness of communication of all participants in the educational process.

Since this survey was based on a study by Heldt et al (2020), it is possible to compare the results obtained. In general, similar results were obtained on similar questions of the survey of our school and schools in Germany. The differences do not exceed 10–12% on average. So, in questions about the media concept at school, almost the same answers were received. This may indicate a unified approach to understanding the design of distant interaction between participants in the educational process. In our opinion, the reason for this is similar national policies on digitalization of education.

On the other hand, it is interesting to compare the answers about the degree of satisfaction in technical and educational support from our and German teachers. In Germany, the level of satisfaction is about the same as in our school. In their study, technical support includes tasks such as maintaining, repairing, and purchasing or replacing devices, as well as installing software or basic instructions in applications.

In our school, the understanding of support is somewhat different, to a greater extent paternalistic. In the opinion of our teachers, support is perceived by them rather not as creating conditions, but as real help in solving issues of distant interaction, or, moreover,

shifting any tasks to the support service. For example, teachers are tempted to have school administrators engage in digital dialogue, while they prefer one-way communication, usually in the form of informational announcements.

The conclusions reached by Heldt, Lorenz and Eickelmann in their research on the importance of the media concept are consistent with our findings. According to foreign researchers, it is the organizational support of teachers that is central. In our research, we went further and revealed different understanding of forms of support by teachers. Teachers consider the school administration to be the initiator and organizer of distant interaction, and themselves rather as performers. It is the corporate culture and professional development programs that contribute to the growth of the initiative on the part of teachers to conduct digital dialogue.

Conclusion

As a result of the study on organizational and managerial decisions to ensure remote interaction at school, the following conditions were identified and empirically tested. Firstly, necessary solutions: technical, pedagogical and organizational forms of support.

Additional important decisions: development of a concept, regulations, recommendations for the organization and implementation of digital communication, the creation of unified media channels, students – teacher, parent – teacher, teacher – school administration, parent – school administration. Improving corporate culture in matters of experience exchange, mutual learning and digital communications.

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Информация об авторах
Дьячкова Анна Викторовна
(Россия, Екатеринбург)
Кандидат экономических наук,
доцент кафедры экономической теории и
экономической политики
Уральский федеральный университет имени первого
Президента России Б. Н. Ельцина
E-mail: a.v.diachkova@urfu.ru
Scopus ID: 57211156711
ORCID ID: 0000-0003-4970-1820

Кулькова Лариса Ивановна
(Россия, Екатеринбург)
Директор Муниципального автономного
общеобразовательного учреждения гимназия № 9
E-mail: lar-kulkova@yandex.ru
ORCID ID: 0000-0003-1643-018X

Information about the authors
Anna V. Diachkova
(Russia, Ekaterinburg)
Associate Professor, PhD in Economics,
Associate Professor of the Department of Economic
Theory and Economic Policy
Ural Federal University named after the first President of
Russia B. N. Yeltsin
E-mail: a.v.diachkova@urfu.ru
Scopus ID: 57211156711
ORCID ID: 0000-0003-4970-1820

Larisa I. Kulkova
(Russia, Ekaterinburg)
Director of Municipal Autonomous educational
organization "Gymnasium 9"
E-mail: lar-kulkova@yandex.ru
ORCID ID: 0000-0003-1643-018X